IN THE CLAIMS

Please amend claims 1 and 3-9 as indicated below.

Please add new claims 17-20 as indicated below.

1. (Currently Amended) A system, comprising:

a rotating shaft having shaft movement parameters;

an incremental shaft encoder coupled to the rotating shaft to convert the shaft movement parameters of the rotating shaft into differentially encoded electrical signals suitable for processing;

~~a first optical~~an electrical-to-optical (E/O) converter coupled to the incremental shaft encoder to convert the differentially encoded electrical signals into optical signals;

a plurality of optical conductors to carry the optical signals; and

~~a second optical~~an optical-to-electrical (O/E) converter to receive the optical signals from the optical conductors and convert the optical signals back into electrical signals.

2. (Original) The system of claim 1, wherein said plurality of optical conductors includes fiber optic cables.

3. (Currently Amended) The system of claim 1, further comprising:

~~an optical~~a shaft coupler configured to couple the rotating shaft ~~movement parameters~~ to the incremental shaft encoder.

4. (Currently Amended) The system of claim 1, wherein the ~~first optical~~E/O converter includes:

a differential-to-single converter to convert the differential encoded electrical signals to single-ended electrical signals; and

a transient over-voltage protection circuit coupled to the differential-to-single converter, wherein the transient over-voltage protection circuit provides over voltage protection of the differentially encoded electrical signals for the differential-to-single converter.

5. (Currently Amended) The system of claim 4, wherein the ~~first optical converter includes level shifting of the input voltage of~~transient over-voltage protection circuit comprises:

a voltage level regulator coupled to the transient over-voltage protection circuit to regulate the differentially encoded electrical signals to a voltage level required by the differential-to-single converter;

a single pole filter coupled to the voltage level regulator to filter noise from the differentially encoded electrical signals; and

a current limiting circuit coupled to the voltage level regulator to limit an electrical current of the differentially encoded electrical signals.

6. (Currently Amended) The system of claim ~~1~~4, wherein the ~~first optical~~E/O converter further includes a single-ended encoder coupled to the differential-to-single converter ~~configured to convert the differentially encoded electrical signals~~ to convert the single-ended electrical signals received from the differential-to-single converter to the optical signals to be transmitted to the optical conductors.

7. (Currently Amended) The system of claim 6, wherein the ~~first optical converter~~single-ended encoder includes:

a plurality of optical couplers to couple the single-ended electrical signals to the optical conductors for transmission; and

a plurality of driver circuit coupled to the optical couplers respectively for each of the single-ended electrical signals, each of the driver circuit including a transistor having a base, an emitter, and a collector,

wherein the base of the transistor receives the respective single-ended electrical signal and the emitter and the collector of the transistor are coupled to the respective optical coupler to drive the optical coupler.

8. (Currently Amended) The system of claim 1, wherein the ~~second optical~~O/E converter includes:

a plurality of optical couplers to receive the optical signals from the optical conductors, and to convert the optical signals to single-ended electrical signals; and

a single-to-differential converter coupled to the optical couplers to convert the single-ended electrical signals to differentially encoded electrical signals.

9. (Currently Amended) The system of claim ~~1~~8, wherein the ~~second optical~~O/E converter further includes a transient over-voltage protection circuit coupled to the single-to-differential converter to provided over voltage protection for the differentially encoded electrical signals.

~~a single-to-differential converter configured to convert the single-ended electrical signals to differentially encoded electrical signals.~~

10. (Original) A method, comprising:

receiving differentially encoded shaft encoder signals;

converting the differentially encoded shaft encoder signals into single-ended electrical signals;

converting the single-ended electrical signals into optical signals; and

transmitting the optical signals through optical conductors.

11. (Original) The method of claim 10, further comprising:

coupling shaft movement parameters of a rotating shaft.

12. (Original) The method of claim 11, further comprising:

converting the coupled parameters into electrical signals.

13. (Original) The method of claim 12, further comprising:

differentially encoding the electrical signals.

14. (Original) The method of claim 10, further comprising:

receiving the optical signals from the optical conductors.

15. (Original) The method of claim 14, further comprising:

converting the optical signals into single-ended electrical signals.

16. (Original) The method of claim 15, further comprising:

differentially encoding the single-ended electrical signals.

17. (New) An electrical-to-optical (E/O) converter for converting differential electrical signals representing shaft movement parameters of a rotating shaft to optical signals, the E/O converter comprising:

a differential-to-single converter to convert the differential encoded electrical signals to single-ended electrical signals; and

a single-ended encoder coupled to the differential-to-single converter to convert the single-ended electrical signals to the optical signals to be transmitted to optical conductors.

18. (New) The E/O converter of claim 17, further comprising a transient over-voltage protection circuit coupled to the differential-to-single converter, wherein the transient over-voltage protection circuit provides over voltage protection of the differentially encoded electrical signals for the differential-to-single converter.

19. (New) The E/O converter of claim 18, wherein the transient over-voltage protection circuit comprises:

a voltage level regulator coupled to the transient over-voltage protection circuit to regulate the differentially encoded electrical signals to a voltage level required by the differential-to-single converter;

a single pole filter coupled to the voltage level regulator to filter noise from the differentially encoded electrical signals; and

a current limit circuit coupled to the voltage level regulator to limit an electrical current of the differentially encoded electrical signals.

20. (New) The E/O converter of claim 17, wherein the single-ended encoder comprises:

a plurality of optical couplers to couple the single-ended electrical signals to the optical conductors for transmission; and

a plurality of driver circuit coupled to the optical couplers respectively for each of the single-ended electrical signals, each of the driver circuit including a transistor having a base, an emitter, and a collector,

wherein the base of the transistor receives the respective single-ended electrical signal and the emitter and the collector of the transistor are coupled to the respective optical coupler to drive the optical coupler.